SITE INVESTIGATION

DEPARTMENT OF TRANSPORTATION

AREA 2

HIGHWAY 880, CYPRESS RECONSTRUCTION

OAKLAND, CALIFORNIA

PREPARED FOR:

STATE OF CALIFORNIA

DEPARTMENT OF TRANSPORTATION

CONTRACT NUMBER: 53P614

TASK ORDER NUMBER: 04-192201-01

PREPARED BY:

GEO/RESOURCE CONSULTANTS, INC.

505 BEACH STREET

SAN FRANCISCO, CALIFORNIA

AUGUST, 1992

JOB NUMBER: 1689-019-00

1.0 INTRODUCTION

Geo/Resource Consultants, Inc. (GRC) was contracted under Contract Number 53P614 and Task Order Number 04-192201-01 by the State of California Department of Transportation (Caltrans) to complete a subsurface investigation at two facilities, Fire Station No. 3 and Church's Fried Chicken (See Figure 1). The purpose of this investigation was to determine if contamination is present, to estimate the potential areal and vertical extent of contamination, and to provide cost estimates for remedial actions, if deemed necessary.

The investigations described in this report are consistent with investigations proposed in the Workplan prepared by GRC and approved by Caltrans (dated June, 1992).

1.1 TASK ORDER MEETINGS

Fire Station No. 3 and Church's Fried Chicken were visited by GRC and Caltrans personnel on May 21 and May 28, 1992. These facilities were also visited by GRC and Bruce Waenas of West Hazmat (the drilling subcontractor) on June 19, 1992.

1.2 SITE BACKGROUND

Fire Station No. 3 and Church's Fried Chicken are located within proximity to each other at the intersections of Pine and Goss Streets and Seventh and Wood Streets in Oakland, respectively. A brief discussion regarding facility operations and prior investigative activities (if known) was provided in the Caltrans Task Order (May 4, 1992) and is summarized below. These descriptions provided the basis for the subsurface investigations conducted at each site.

Fire Station No. 3
727 Pine Street
Oakland, California 94607

The fire station has one diesel underground storage tank (UST) located on the northeast side of the property. A small tank leak was noted in 1985. No information was available regarding the tank capacity.

Church's Fried Chicken
1766 7th Street
Oakland, California 94607

The property was occupied by a service station from 1962 to 1979. The site was reported have maintained four 4,000-gallon gasoline tanks and one 550-gallon waste oil tank. No records of the tank removal were available for this site investigation.

2.0 FIELD METHODOLOGY

Field methodology pertaining to hand augering, soil boring drilling, monitoring well construction and sampling was conducted in general accordance with the California Site Mitigation Decision Tree , the Environmental Protection Agency (EPA) Ground-Water Monitoring Technical Enforcement Guidance Document (TEGD), and Geo/Resource Consultants Field Procedures Manual (September, 1989). Descriptions of standard methodologies are included in Appendix A. Specific field activities and methodologies are described below.

2.1 FIRE STATION NO. 3

On June 22 and 23, 1992, four borings (FS/B-1, FS/B-2, FS/H-1, and FS/W-1) were drilled using rig-powered, 8-inch-diameter hollow stem augers. The purpose of the borings was to investigate potential leakage from the existing UST (See Figure 2). Borings FS/B-1, FS/B-2, FS/H-1, and FS/W-1 were terminated at 10.0 feet, 10.0 feet, 12.5 feet, and 20.0 feet below ground surface (bgs), respectively. Soil samples were generally collected at 1 foot, 5 feet, and 7 feet bgs. Specific sampling locations are depicted in the Lithologic Logs included in Appendix B.

One ground-water sample was collected in boring FS/H-1 from a depth of approximately 12.5 feet using the "Hydropunch" technique.

Upon completion of soil sampling, the three borings were backfilled with cement grout and the cuttings were disposed of in 55-gallon United States Department of Transportation (U.S. DOT) approved drums.

A 2-inch-diameter monitoring well was constructed at boring FS/W-1. The well was screened between 5 feet and 20 feet bgs and was constructed of 0.020-inch slotted Poly Vinyl Chloride (PVC) pipe. The annular space was filled with No. 3 Monterey sand to a depth of 3 feet bgs and bentonite pellets were placed to a depth of approximately 1.5 feet bgs. The remainder of the annular space

was filled with cement grout and an underground locking monument well box was cemented into place.

The monitoring well, FS/W-1, was developed on June 26, 1992 using the surge and bail technique. Approximately 53 gallons of water was purged from the well during development. Well development logs are included in Appendix C.

The monitoring well, FS/W-1, was sampled on July 1, 1992. Prior to sampling, the water level was measured and the well was subsequently purged of 18.5 gallons. The ground-water parameters, pH, electrical conductivity, and temperature were measured during purging. Water sampling logs are included in Appendix C.

Soil cuttings, development water and purge water were disposed of in 55-gallon U.S. approved DOT drums.

2.2 CHURCH'S FRIED CHICKEN

On June 23 and 24, 1992, seven soil borings (CFC/B-1, CFC/B-1A, CFC/B-2, CFC/B-3, CFC/B-4, CFC/B-5, and CFC/H-1) were drilled using rig-powered 8-inch-diameter hollow stem augers. The borings were drilled to investigate potential leakage from removed USTs (See Figure 3). Borings CFC/B-1, CFC/B-1A, CFC/B-2, CFC/B-3, CFC/B-4, CFC/B-5, and CFC/H-1 were terminated at 3.0 feet, 8.5 feet, 10.0 feet bgs, 8.5 feet, 10.0 feet, 4.5 feet and 10.0 feet, respectively. Soil samples were generally collected at 1 foot, 5 feet, and 7 feet bgs. Exceptions were borings CFC/B-1 and CFC/B-5 which, due to obstructions encountered in the boreholes, were only sampled at 1 foot and 3 feet bgs. Specific sampling locations are depicted in the Lithologic Logs included in Appendix B.

One ground-water sample was collected on June 24, 1992 in boring CFC/H-1 from a depth of approximately 10 feet bgs using the "Hydropunch" technique.

Upon completion and review of laboratory analyses indicating high levels of hydrocarbons, a second phase follow-up investigation was initiated on June 29, 1992. This phase included drilling

3.0 FINDINGS

This section describes subsurface conditions encountered during the field investigations, as well as analytical findings for Area 2.

3.1 SUBSURFACE CONDITIONS

Subsurface conditions at each site were evaluated from lithologic logs, water level measurements and photoionization (PID) readings from the on-site HnU meter. These data are discussed below and are included in Appendices B and C.

3.1.1 Fire Station No. 3

The area investigated at the Fire Station No. 3 is underlain to the depths explored by silty sands (See Appendix B). Within the four borings, dark brown, fine-grained, loose to medium dense silty sand was present from the ground surface to approximately 4 to 6 feet bgs. With increasing depth, the silty sand color changed to light brown. Much of the soil encountered (to exploration depths of ten feet bgs) was interpreted as fill. Man-made debris was encountered in boring FS/B-2 at approximately 2 feet bgs.

Ground water in the site area was measured at approximately 7 feet bgs in monitoring well FS/W-1 on June 26, 1992.

HnU readings were obtained from each of the soil samples collected. Hydrocarbons were present at relatively low test levels of 1 to 2 parts per million (ppm) in all the soil samples tested.

3.1.2 Church's Fried Chicken

The area investigated at the Church's Fried Chicken site is underlain predominantly by fine silty sand with minor amounts of gravel and clay. (See Appendix B). The silty sand was observed to range from light to dark brown to depths of approximately 2 to

summarized on Tables 2-A, 2-B, and 2-C and are included in Appendix D. The findings are briefly described below.

3.2.1 Fire Station No. 3

Soil borings FS/B-1, FS/B-2, FS/H-1, and FS/W-1 were drilled to total depths, respectively, of 10.0 feet, 10.0 feet, 12.5 feet, and 20.0 feet. Three soil samples collected from the unsaturated zone at each boring location (for a total of twelve samples) were chemically analyzed for total petroleum hydrocarbons (TPH) as diesel (TPH-D) by modified EPA Method 8015. Ground water samples collected from FS/H-1 and FS/W-1 were analyzed for TPH-D.

Soil

TPH-D was not present above laboratory detection limits in any of the twelve soil samples.

Ground Water

The ground-water samples collected from FS/H-1 and FS/W-1 did not contain TPH-D above laboratory detection limits.

3.2.2 Church's Fried Chicken

Soil borings CFC/B-1, CFC/B-1A, CFC/B-2, CFC/B-3, CFC/B-4, CFC/B-5, CFC/B-6, CFC/B-7, CFC/H-1, CFC/W-1, CFC/W-2, and CFC/W-3 were drilled to depths ranging from 3.0 feet to 20.0 feet. Soil borings drilled in backfill at the former tank site locations included CFC/B-1, CFC/B-1A, CFC/B-2, CFC/B-3, CFC/H-1, and CFC/W-1. Boring CFC/B-4 was drilled in the backfill at the former waste oil tank location. Borings CFC/B-5 and CFC/B-6 were drilled near the former pump island locations. Borings CFC/B-7, CFC/W-2 and CFC/W-3 were drilled near the perimeter of the property.

Three soil samples were collected from most of the borings drilled at Church's. Two soil samples were collected at boring location CFC/B-5 (for a total of 32 samples). One "Hydropunch" ground-water sample was collected from CFC/H-1. The one soil

4.0 REGULATORY FRAMEWORK

The regulatory framework as it pertains to this site investigation is described in Appendix E. Regulatory agencies that set forth guidelines and statutes that may impact these sites include the California Environmental Protection Agency (CalEPA), the California Regional Water Quality Control Board (RWQCB), the Alameda County Water District (ACWD), and the Alameda County Department of Environmental Health (ACDEH). This section describes the potential applicability of various waste characterization regulations and criteria at each of the sites in Area 2.

4.1 FIRE STATION NO. 3

Soil

No contaminants were detected above minimum test method limits in soil samples at the Fire Station No. 3 site. Thus, regulatory guidelines or statutes have not been exceeded at this site.

Ground Water

No contaminants were detected above minimum test method limits in ground water samples at the Fire Station No. 3 site. Thus regulatory guidelines or statutes have not been exceeded at this site.

4.2 CHURCH'S FRIED CHICKEN

Soil

At the Church's Fried Chicken site, a number of detected contaminants exceeded accepted state guidelines in soil near the former gas tank, pump islands, and waste oil tank locations. Concentrations of TRPH and/or TPH-G exceeded 1,000 mg/kg in soil samples obtained from four borings:

5.0 REMEDIAL ACTIONS

Limited data were obtained at the sites investigated for this Task Order. Therefore, potential contaminant plume boundaries in all directions cannot be determined. However, for the purposes of providing generalized estimates remedial volumes of potentially contaminated soil have been derived from our limited data regarding soil conditions, and types and concentrations of contaminants. These estimates are considered to be very preliminary and should not be construed as final, and at all of the sites where contamination was detected, further investigation is recommended to define its lateral and vertical extent. Only from subsequent investigations can reliable cost estimates of remedial actions be provided.

5.1 FIRE STATION NO. 3

Based on soil and ground-water test results no contaminants were detected at the Fire Station site, thus no remedial action is recommended at this time.

5.2 CHURCH'S FRIED CHICKEN

Soils at the Church's Fried Chicken site were found to be contaminated with TRPH, TPH-G, BTEX compounds and elevated levels of lead and mercury. Ground water was found to be contaminated with TPH-G, and BTEX compounds. The following discussion outlines the assumptions used to estimate the quantity of contaminated soil and groundwater to be remediated.

Soil

Tank Site:

At the former gasoline tank site location, soil samples from only one boring, CFC/W-1 was found to be contaminated with concentrations of TPH-G of up to 3,000 mg/kg. However, soil borings CFC/B-1A, CFC/B-7, and CFC/H-1 contained TPH-G at concentrations of over 100 mg/kg Based on these data points,

6.0 CONCLUSIONS

Four borings, including two soil borings, one "hydropunch" boring and one monitoring well were drilled at Fire Station No. 3 to investigate potential leakage from an existing UST. Soil and ground-water samples collected from these borings did not contain hydrocarbons above laboratory detection limits. Therefore, regulatory guidelines and statutes were not exceeded and remediation within the general area of the UST does not appear necessary.

At Church's Fried Chicken, seven borings, including one "hydropunch" boring and three monitoring wells, were drilled to investigate potential leakage from four removed gasoline tanks and one removed waste oil tank. Soil samples collected from the gasoline UST area, the pump island area, and the waste oil UST area contained elevated levels of hydrocarbons and metals. The highest hydrocarbon concentrations appear to be related to leakage from pipelines and to the pump island area. Based on the occurrence and concentrations of contaminants, volumes of soil that could require remediation were estimated.

Based on analytical results for ground water, it appears that ground-water contamination may be contained within the property boundaries, although additional investigations should be conducted to confirm this. Volumes of potentially contaminated ground water underlying the property boundaries were estimated.

APPENDIX E - REGULATORY FRAMEWORK

This Appendix describes applicable regulations set forth by the California Environmental Protection Agency (CalEPA), the California Regional Water Quality Control Board (RWQCB), the Alameda County Water District (ACWD), and the Alameda County Department of Environmental Health (ACDEH).

E.1 CALIFORNIA ENVIRONMENTAL PROTECTION AGENCY

Under CalEPA regulations, contaminated soils may be characterized as hazardous or as "designated" waste.

Regulations set forth by the CalEPA pertaining to contaminated ground water are based on the contaminants' known or suspected affects on human health. CalEPA provides state action levels and maximum contaminant levels (MCLs) for various organic and inorganic contaminants in drinking water. MCLs are statutes which may be enforced and state action levels are health advisory guidelines.

While CalEPA establishes safe drinking water standards, the California Regional Water Quality Control Board (RWQCB) is the regulating agency for ground-water investigations.

Hazardous Waste

At present, CalEPA has set a total petroleum hydrocarbon (TPH as gasoline) concentration of 1,000 milligrams per kilogram (mg/kg) as a hazardous waste classification criterion. This value is based on ignitability characteristics of gasoline in sandy soil (Memorandum by Toxic Substances Control Program, July 2, 1990). Although this level is not considered to be a sufficient criterion to classify wastes as hazardous by the DHS, The RWQCB Leaking Underground Fuel Tank (LUFT) Task Force recommends that the 1,000 mg/kg TPH value be used by field personnel to classify contaminated soil as hazardous waste until new criteria are released by CalEPA.

Standards pertaining to some oragnic and inorganic compounds (primarily metals) are described in the California Code of Regulations (CCR) Title 22, Division 4, Section 66699. These standards set Total Threshold Limit Concentration (TTLC) values and Soluble Threshold Limit Concentration (STLC) values for some constituents in soils. TTLC values refer to the maximum allowable total concentration of a constituent in soil and STLC values refer to the maximum allowable leachability from the soil. A generally accepted rule-of-thumb is that any compound with a TTLC analytical test result which is greater than 10 times its STLC value could be in excess of the STLC. To determine the constituent's leachability, the sample should be re-submitted for the Waste Extraction Test (WET).

Designated Wastes

In an attempt to provide standards for waste disposal, CCR Title 23 Subchapter 15 defines "desginated waste" as "nonhazardous wastes which consist of , cor contain, pollutants, which, under ambient environmental conditions at the waste management unit, could be released at concentrations in excess of applicable water quality objectives, or could cause degradation of waters of the state". Designated wastes may be discharged to Class II waste management units which have engineered containment features (Marshack, 1989). Designated wastes are addressed by ACDEH and are discussed further below.

State Action Levels and MCLs

California State Action Levels and MCLs are provided by the DHS Public Water Supply Branch (June, 1989). Although ground water within the project site area would probably not be considered as a potable water supply due to the proximity and potential intrusion of saline bay waters, these levels are provided within the text for comparative purposes.

E.2 UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

The U.S. Environmental Protection Agency (EPA) has finalized "waste characteristics" regulatory levels for 25 chemical constituents. Many of these chemical are regulated by CalEPA,

and have corresponding TTLC and STLC. Benzene is one of the chemicals that are not regulated by CalEPA and are regulated by the U.S. EPA. The Toxic Characteristic Leaching Potential (TCLP) for benzene is 0.5 mg/l. The dilution for the TCLP test is 20:1. Thus, total benzene in concentrations of 20 times the TCLP could possibly exceed the TCLP. TCLP criteria are not provided for toluene, xylenes or ethyl benzene.

E.3 REGIONAL WATER QUALITY CONTROL BOARD

The RWQCB for the North Coast, the San Francisco Bay and the Central Valley have compiled "Tri-Regional Board Staff Recommendations for Preliminary Evaluation and Investigation of Underground Tank Sites" (August, 1990). This document describes guidelines for removing and investigating potential contamination from underground tank investigations, as well as procedures for site closures and remediation programs. However, these guidelines do not provide specific action levels or cleanup levels for petroleum constituent.

The RWQCB has also set forth guidelines to conduct a Leaching Potential Analysis for gasoline and diesel using TPH concentrations. These guidelines are set forth in the LUFT Manual (revised April, 1989). The LUFT Manual provides a scoring method for deriving TPH concentrations that may be left in-place without degrading shallow ground water. Through this scoring methods, depth to ground water and other pertinent physical characteristics of the site may be evaluated and a maximum allowable TPH level may be derived. These guidelines should be used when a site is more fully characterized and would not be appropriate for the Cypress Structure project at this preliminary phase of investigation.

E.4 ALAMEDA COUNTY WATER DISTRICT (ACWD)

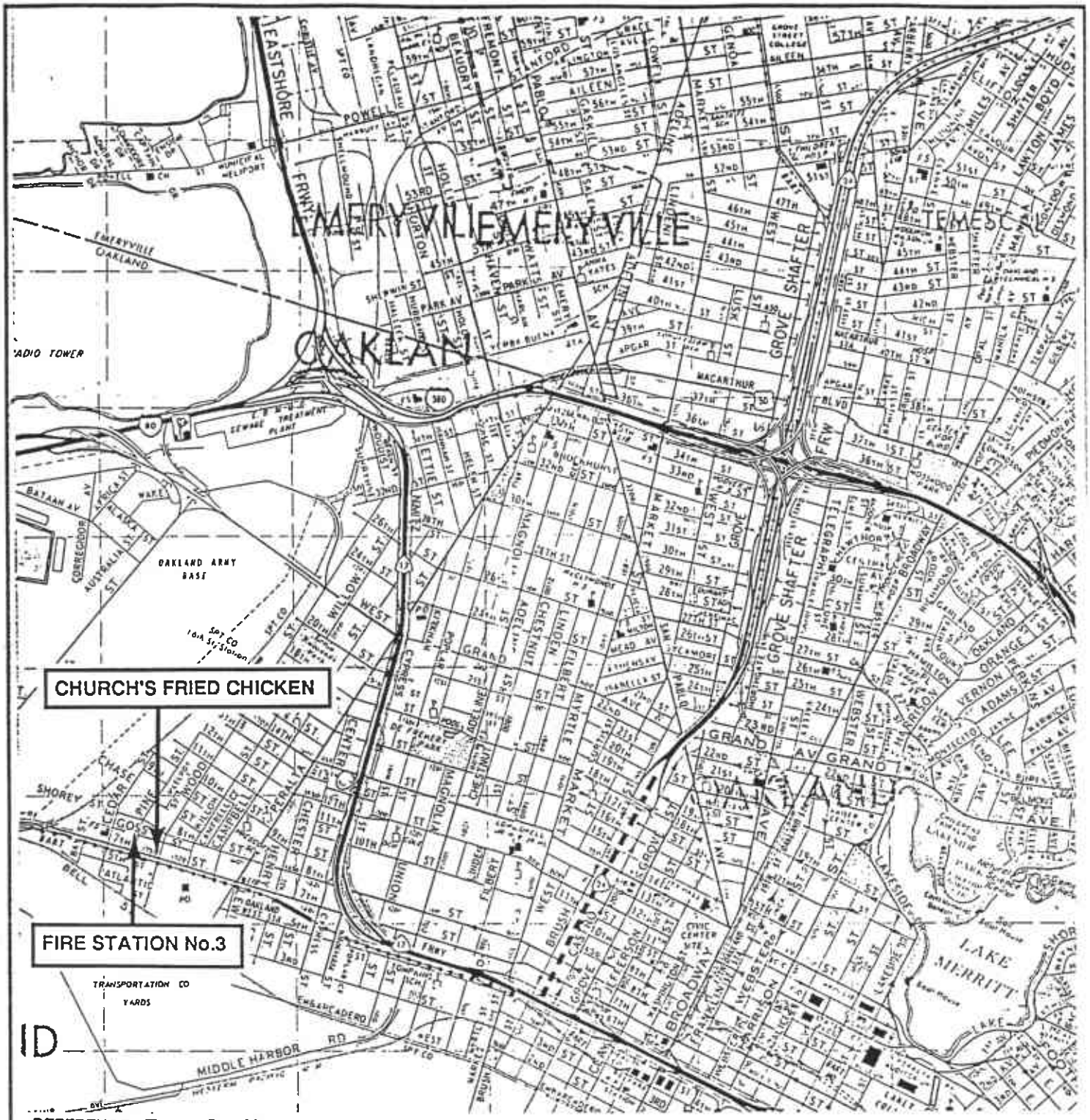
Alameda County Water District (ACWD) is the agency that requires well permitting for most cities (including Oakland) within Alameda County. Zone 7 has provided guidelines regarding monitoring well construction, soil and ground-water sampling and guidances for underground tank investigations (ACWD, February,

1990 Revision). These guidelines were reviewed prior to initiating the site investigation for this project and should be used for further site investigations at specific sites.

The ACWD guidelines referred to above state that soil contaminated with petroleum products in excess of 1,000 mg/kg is considered a hazardous waste. Storage on site (above or below grade) for more than 90 days is not allowed under Title 22, Article 6 (666508A) without either a variance or permit. Materials shown to contain concentrations between 100 and 1,000 mg/kg TPH or Total Oil & Grease (TOG) are classified as "designated wastes" and may be subject to similar requirements.

E.5 ALAMEDA COUNTY DEPARTMENT OF ENVIRONMENTAL HEALTH

The Alameda County Department of Environmental Health (ACDEH) recommends that underground tank investigations be conducted in accordance with the RWQCB Tri-Regional guidelines as discussed above.



REFERENCE : Thomas Bros Maps,
Alameda, Contra Costa Counties

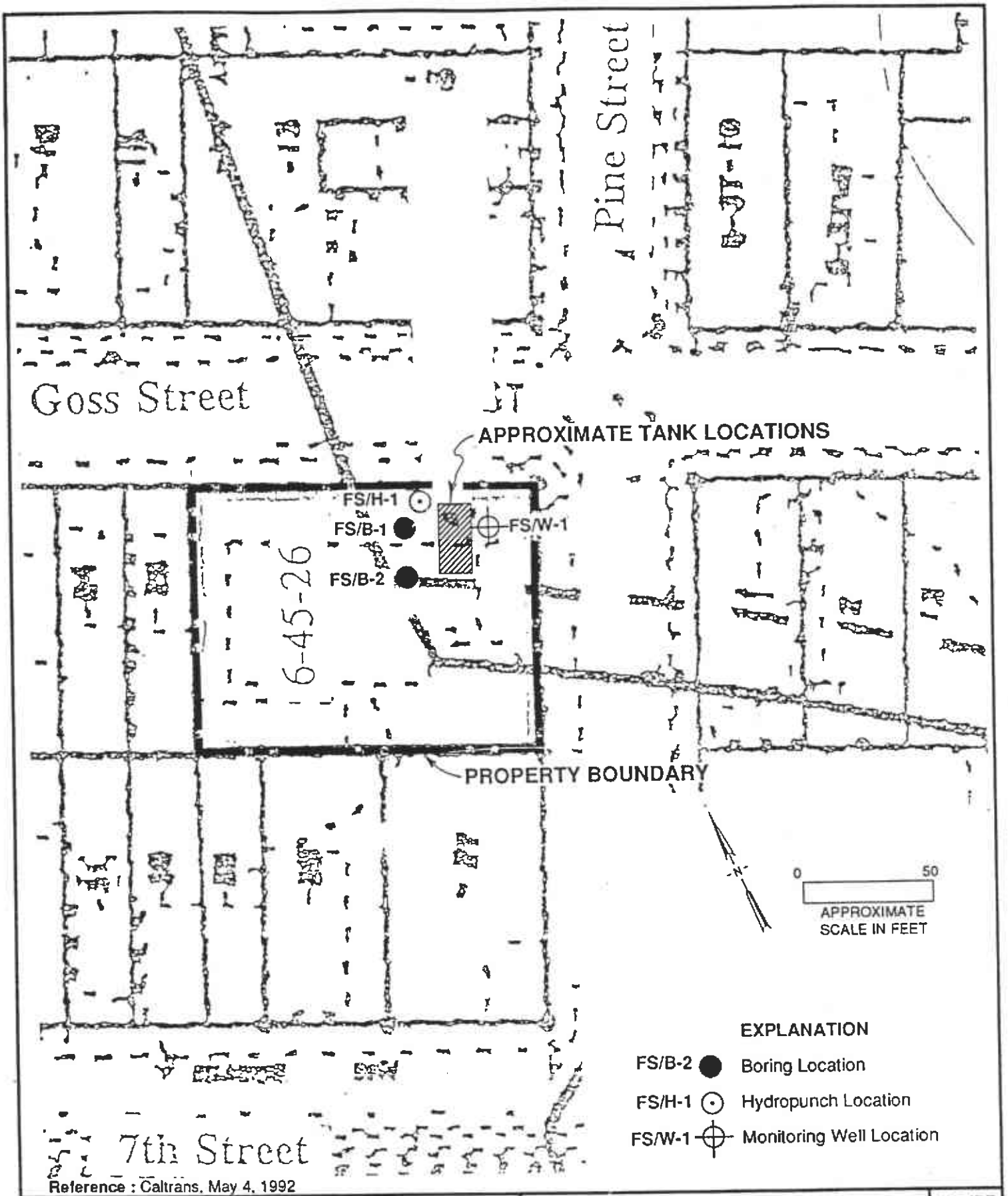
-N- 0 2200
SCALE IN FEET

Geo/ Resource Consultants, Inc.
GEOLOGISTS / ENGINEERS / ENVIRONMENTAL SCIENTISTS
505 BEACH STREET, SAN FRANCISCO, CALIFORNIA 94133

Job No. 1689-019-00 Appr. AOT Date 7/22/92

VICINITY MAP - AREA No.2
SITE INVESTIGATION REPORT
DEPARTMENT OF TRANSPORTATION
INTERSTATE 880,
CYPRESS STRUCTURE RECONSTUCTION
OAKLAND, CALIFORNIA

FIGURE
1



Reference : Caltrans, May 4, 1992

Geo/ Resource Consultants, Inc. GEOLOGISTS / ENGINEERS / ENVIRONMENTAL SCIENTISTS 505 BEACH STREET, SAN FRANCISCO, CALIFORNIA 94133	SITE PLAN - AREA 2 FIRE STATION No.3 - PARCEL No.12 D.O.T. - INTERSTATE 880 CYPRESS STRUCTURE RECONSTRUCTION OAKLAND, CALIFORNIA	FIGURE 2
Job No. 1689-019-00 Appr. [illegible] Date 7/20/92		

TABLE 1 (CONTINUED)
AREA 2

DOT - CYPRESS

SUMMARY OF ANALYTICAL RESULTS - SOIL

GENERAL

SAMPLE ID	TOTAL HYDROCARBONS AS DIESEL (mg/kg) EPA NO. 8015m
FIRE STATION No. 3	
-Boring	
FS/B-1-2	ND
FS/B-1-6	ND
FS/B-1-9.5	ND
FS/B-2-2	ND
FS/B-2-6	ND
FS/B2-9.5	ND
-Hydropunch	
FS/H-1-2	ND
FS/H-1-5	ND
FS/H-18	ND
-Well	
FS/W-1-2	ND
FS/W-1-5	ND
FS/W-1-8	ND
Detection Limit	5.0

NOTES: ND = Not Detected at Detection Limit on Lboratory Data Sheets

Laboratory Analyses performed by CKY

TABLE 3

AREA 2

DOT - CYPRESS

SUMMARY OF ANALYTICAL RESULTS - GROUNDWATER

	EPA No.	CFC/H-1	CFC/W-1	CFC/W-2	CFC/W-3	FS/H-1	FS/W-1	DETECTION LIMIT	MCLs
TPH-G (mg/L)	8015m	30	2	ND	ND	-	-	1.0	NA
TPH-D (mg/L)	8015m	-	-	-	-	ND	ND	1.0	NA
Benzene (ug/L)	8020	1,000(5)	16	ND	14	-	-	1	1
Toluene (ug/L)	8020	900(5)	3	ND	ND	-	-	1	100
Ethyl Benzene (ug/L)	8020	400(5)	ND	ND	ND	-	-	1	680
Xylenes(ug/L)	8020	1,200(5)	500	6	10	-	-	1	1750

NOTES: ND = Not Detected at Detection Limit on Laboratory Data Sheets

- = Not analyzed

() = Detection Limit

TPH-G = Total Petroleum Hydrocarbons as Gasoline

TPH-D = Total Petroleum Hydrocarbons as Diesel

MCLs = State Maximum Concentration levels, Primary and Secondary, provided by comparision purposes only, State Action Levels included

Laboratory Analyses performed by CKY